Lockheed Aircraft Corp.	ENGINEERING STUDY [X] CHANGE PROPOSAL [X]	LAC -47-1
DATE 8-13-59	AFFECTS: WSPO [ ]	PROJECT [X]

NAME OF MAJOR COMPONENT	PART OR LOWEST SUBASSEMBLY	PART NO. & MODEL OR TYPE
Oxygen System	Seat Pack	Q-207

TITLE OF PROPOSAL :
Dual Oxygen Seat Pack Installation

NATURE OF PROPOSAL :
1. Replace the present Q-207 Seat Pack with a production Dual Oxygen seat pack which is identified as Q-270.
2. This pack has a new type disconnect coupling incorporating automatic emergency oxygen supply actuation.
3. No change to the aircraft oxygen system is required other than the relocation of the disconnect.
4. The first production pack will be tested at the EAFB altitude chamber.
5. For detail description of the Q-270 system, see pages 2 and 3 and attached drawing.
6. Additional production Q-270 packs to be furnished on Depot Purchase Requests. To replace all present Q-207 packs will require approximately [illegible] Q-270 packs.

REASON FOR PROPOSAL :
1. To incorporate additional in-flight safety provisions in the oxygen system by installing a seat pack with two oxygen regulators and a valving arrangement permitting the pilot optional use of both or either one of the pressure regulators.
2. To incorporate an improved disconnect coupling with automatic green apple actuation.
3. To incorporate requested thigh straps and quick harness disconnect.
4. To incorporate requested fiberglass survival gear container.

ES	ESTIMATED COST AND TIME INVOLVED :	
	ADDITIONAL FUNDING REQUIRED :	See page 4
CP	ESTIMATED COST FOR KITS OR PARTS :	
	ADDITIONAL FUNDING REQUIRED :	See page 4

ITEMS AFFECTED BY PROPOSAL :

SAFETY	MISSION EFFEC-TIVENESS	PERFORM-ANCE	OPERATING PROCEDURE	INTER-CHANGE-ABILITY	WEIGHT OR WEIGHT & BALANCE	TOOLS & SUPPORT EQUIPMENT	MAINTE-NANCE PROCEDURE	SERVICE LIFE	FLIGHT MANUAL	MAINTE-NANCE MANUAL
[X]	[X]	[ ]	[X]	[X]	[ ]	[ ]	[X]	[ ]	[X]	[X]

EST. MAN/HRS. REQ'D. TO ACCOMPLISH CHANGE IN FIELD

SOURCE OF PARTS FOR KIT	AVAILABILITY _____ WEEKS AFTER APPROVAL
LAC	See page 5

DISPOSITION OF SPARES AFFECTED
See page 4 - Section "C"

INITIATED BY :	APPROVED : ~~WSPO~~ PROJECT
LAC	

STAT

DUAL OXYGEN SEAT PACK

1. The enclosed drawing Q-216 shows the dual regulator seat pack presently used by LAC pilots. To date, approximately 1700 flight hours have been accumulated on three packs with no in-flight difficulties encountered.

2. Although the Q-270 pack is not identical to the Q-216, its basic principles are the same, the changes being refinement of mechanical design, location of components and method of packaging to facilitate maintenance.

Description of Pack

Reduced pressure oxygen is directed from the airplane system through the quick disconnect to a selector valve. This valve is controlled by a lever which is located on the left forward side of the pack. (See enclosed drawing.) The valve may be positioned to allow operation through regulator #1, regulator #2 or through both regulators simultaneously. The selector valve is so arranged that oxygen is never shut off to either regulator during the time the valve is shifted from one position to another.

A production dual regulator assembly is in process at Firewel. This assembly consists of two regulators assembled to a shuttle valve. The total assembly is at Firewel in order to produce the best possible mating of regulators and valve.

The outlets from both regulators are connected to the shuttle valve. This valve consists of two sections; one for the mask flow and the other for the suit flow. Each section of the valve contains a check valve so arranged that when only one regulator is operating, the outlets from the other regulator are closed. Thus, if the inoperable regulator has a leak within it, the outlet flow from the operable regulator will not be discharged through the leak. The check valves are of such design that they cannot plug any orifice in the case of malfunction and they will not close of their own accord, thereby allowing direct connection between the mask/suit and the regulator so that the mask/suit will be adequately vented in the event of rapid decompression. Mask and suit outlets are provided on the valve to which the appropriate hoses are connected.

Two press-to-test buttons are provided on the right hand thigh support; one for each regulator and when used in conjunction with the selector valve, the operating condition of each regulator may be determined.

An emergency source of 96 cu. in. oxygen is supplied which is 1.7 times that in the system now in use in the Q-207 packs. This oxygen is routed through the selector valve and may be delivered to either or both regulators, depending upon the pilot's requirements.

Quick Disconnect

The Q-270 system requires the use of only one disconnect. Much discussion has taken place regarding one versus two disconnects. The attached drawing, Figure I, shows the system as described above using one disconnect. Figure II shows the configuration required if two disconnects were used. It can be seen that Figure II depicts a system that is "true" dual in that there is no interconnection between the two systems other than the source and the terminus; however, this introduces certain undesirable features that are not inherent in the system depicted in Figure I; namely:

1. If either pressure reducer is in the "off" position and a failure occurs in the regulator, or if the regulator is turned off on the opposite system, then the flow of oxygen will be stopped.

2. A leaking "O" ring in one disconnect could not be detected if only one system were "on". This would cause the ship's oxygen supply to be rapidly depleted and if detected by the pilot when switching to the other system, his corrective action would be to shut off the leaking system, thus nullifying the one complete system.

3. The possibilities of having a leaking "O" ring or similar disconnect leak are doubled with two disconnects.

4. Two oxygen lines in one disconnect fitting only double the leaking problem without making the disconnect more reliable.

5. The automatic switch-over and warning feature presently operable in the airplane pressure reducer system would be eliminated.

6. An additional supply hose would be required between the airplane and the seat pack.

Packaging

A fiberglas container consisting of two halves will be provided to house the oxygen system and the survival gear container. The upper half will contain the complete oxygen installation, including controls and disconnect. The present contour top will be maintained except that extensions will be added to the front portion for more comfortable leg supports and an extension will be added to the back to provide parachute support. An operating handle will be installed to control the deployment of the kit. The survival gear, except life raft, will be packed in a waterproof bag, usable as a rucksack, and stowed in the lower half of the kit. The life raft will be stowed separately from the survival gear bag.

The seat pack release system is identical to that presently used in the F-104, F-106 and other AF operational aircraft, except that an automatic disconnect is not provided for the mask and suit hoses to the pack. This disconnect is eliminated in favor of continuous hoses to provide better leak proof reliability in these two highly important lines.

Next 1 Page(s) In Document Exempt

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DUAL OXYGEN SEAT PACK SCHEDULE